

connect the Fishes with the Annelidans.\* Perhaps those butterflies of the ocean, the flying fishes,† with their painted wing-fins with branching rays, may look towards the *Lepidoptera* amongst Insects, but there is no direct connexion at present discovered between the two Classes.

The characters of the Class of Fishes are—*Body* with a vertebral column, covered with *scales*, and moved by *fins*. *Respiration* by permanent *gills*. *Heart* with only one *auricle* and one *ventricle*; *blood* red, cold.

Fishes are distinguished from the other vertebrated animals, especially birds and beasts, by their mode of *respiration*; the *latter*, breathing the atmospheric air, are furnished with *lungs*, which receive that element, oxygenate the blood, and again expel it in a different state; while the *former*, which must decompose the water for respiration, breathe by means of *gills*, found also in many invertebrates; these are usually long, pointed plates, disposed like the plumules of a feather, or teeth of a comb, in fishes attached to bony or cartilaginous bows; each of them, according to Cuvier, covered by a tissue of innumerable blood-vessels; but, according to Dr. Virey,‡ having a minute vein and artery. In the gill of a cod-fish, which I have just examined under a microscope, a vein and artery traverse each plate longitudinally at the margin, which appear to be pectinated, at right angles on each side, with innumerable minute branches, and resemble, in this respect, the gills of Crustaceans.§ Thus the blood is oxygenated by the air mixed with the water, and carried to the heart, whence it is distributed to the whole body. So that the aërated water produces the

\* Sir E. Home, Philos. Trans. 1815, 265.

† *Exocoetus volitans*, &c.

‡ N. D. D'H. N. iv. 330.

§ Latr. Cours. D'Ent. t. 2. f. 2.